

# Nail Salon Ventilation

## Introduction

Ventilation is the supply and circulation of air in a building. It can be provided by either natural or mechanical means. Natural ventilation is simply the supply of outside air by opening windows and doors. Mechanical ventilation requires the installation of fans, ducts and other equipment to draw air in and out of a room and evenly distribute air throughout the space. Mechanical ventilation is usually the preferred method of providing air to work spaces, since it is more consistent and can provide a more uniform, predictable amount of fresh air, independent of weather conditions.



## Air Quality Problems

Air quality problems can exist without the presence of “toxic” levels of pollutants. The most frequent cause of so-called “bad air” complaints involves the build-up of low levels of contaminants from sources such as furniture, rugs and office machines. Additionally, air that seems stale or stuffy may not have enough fresh air and/or may be too dry. Energy-efficient buildings often do not supply enough fresh air to dilute low-level contaminants adequately. In addition, ventilation systems are often not maintained properly and fail to provide the same levels of ventilation as they were originally designed to provide. The National Institute for Occupational Safety and Health (NIOSH) estimates that about half of indoor air quality complaints are due to the lack of adequate ventilation.

Symptoms often associated with poor indoor air quality include headaches, inability to concentrate, dizziness, nausea, eye and throat irritation, excessive fatigue and general malaise. Reactions can vary due to differences in individual susceptibility. Air Quality in Nail Salons Nail salons, as well as other businesses in which hazardous chemicals are used, present special problems. The vapors and dusts of such substances are generated close to the breathing zone of workers and customers, and can cause a variety of acute and long-term diseases. When ventilation is not sufficient, airborne chemicals in nail salons build up.

## Ventilation Systems in Nail Salons

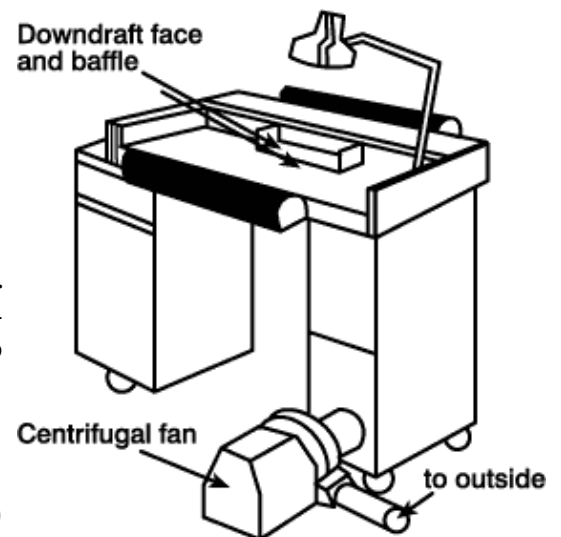
**General ventilation systems** designed for offices, schools and other non-industrial settings are usually not adequate for keeping toxic substances at “safe” concentrations. Such ventilation dilutes, but does not completely remove, contaminants from the air.

**Local exhaust ventilation** is far more effective because it captures and removes contaminants at their source before they reach the air that you breathe. To adequately protect both nail technicians and customers, both kinds of ventilation should be installed. Nevertheless, general ventilation, if properly installed, operated and maintained, can by itself significantly reduce chemical exposures and improve the environment of the salon.

## Ventilated Tables

A ventilated table is an example of local exhaust ventilation that is effective because it prevents toxic chemicals from reaching the breathing zone of both nail technicians and customers. Ventilated tables have fans that pull the chemical vapors into a duct and prevent them from entering the room’s atmosphere. The ventilated table should be designed to vent contaminated air directly to the outside, not inside the shop. The outside exhaust duct should be located away from air intakes or windows to avoid re-contaminating the room or blowing dirty air into other occupied spaces. Ventilated tables are available that filter (with charcoal or a dust filter) and re-circulate the air. However, they are *not recommended*, since there is no way to determine how often the filters should be changed. It is likely that users will either change them too often, thereby wasting money, or too infrequently, causing over-exposure to hazardous chemicals.

If ventilated tables are used, the exhaust air must be replaced with make-up air from a heating, ventilation and air conditioning system (HVAC) that conditions and distributes the replacement air. Without such a system,



replacement air will leak into the salon through doors and windows and will be too hot in summer and too cold in winter. Workers may then respond by shutting off the ventilated tables.

Table-top or other fans should not blow air in the direction of the exhaust ventilation, since this arrangement will interfere with its proper operation. The shop owner and employees should be trained in the correct use and maintenance of the ventilated table.

For details on how to design and install a ventilated table, obtain the NIOSH publication, “**Controlling Chemical Hazards During the Application of Artificial Fingernails**” available at: <http://www.cdc.gov/niosh/docs/99-112/>

## **General Room Ventilation**

As with any indoor environment, nail salons should provide general dilution ventilation with an adequate supply of outside air. However, if a local exhaust system is not in place, it is especially important to have a good room ventilation system. The minimum recommended amount of outside air is 25 cubic feet per minute (cfm) per occupant. This should be considered the minimum amount, and significantly more air flow may be required to reduce chemical vapors and avoid complaints from occupants.

In order to assure that the HVAC is supplying an adequate amount of outside air, a qualified HVAC or engineering firm should directly measure the flow of outside air into the salon. However, as an initial screening, the owner may first want to measure the concentration of carbon dioxide, which is an indirect indicator of the supply of outside air. In this case it is important to have at least as many people in the salon, at the time of the measurement, as the maximum number expected in the salon during normal operation. (Such a condition is required since the room occupants are the primary source of carbon dioxide.) As a rough indicator, 700 ppm of carbon dioxide corresponds to about 25 cfm of outside air per person.

To avoid spreading chemical vapors to neighboring businesses, nail salons should not share the same ventilation system with another business and should be under negative air pressure in relation to adjacent spaces. To maintain negative pressure, the salon should exhaust slightly more air than is supplied so that any leakage of vapors will not enter adjacent businesses. In addition, walls separating the salon from other businesses should have no holes, gaps or cracks.

## **Legal Requirements**

Several agencies have regulations that have some bearing on ventilation in nail salons.

### ***Massachusetts State Building Code***

The state building code requires all buildings to have either natural or mechanical ventilation. Naturally ventilated spaces must have windows whose portion that can be opened equals at least 4% of the floor space. If there is mechanical ventilation, it must meet the requirements of the code that was in effect at the time that the building was constructed or renovated. However, if the building code inspector determines that there is a significant health hazard, he/she may require appropriate building modifications. The latest version of the code (1997) calls for 25 cfm of outside air per occupant in beauty salons. The code is enforced by the local building department.

### ***Massachusetts Board of Cosmetology***

The Board of Cosmetology has regulations governing the operation of salons. They mandate the provision of “proper and adequate” ventilation in all salons. However, the regulations do not define this term.

### ***Occupational Safety and Health Administration (OSHA)***

OSHA is the federal agency that establishes and enforces regulations for health and safety in the workplace. It requires engineering controls, such as local exhaust ventilation, when chemicals in the workplace exceed specified limits (permissible exposure limits – PELs). There are, however, certain limitations to OSHA enforcement. Air monitoring in numerous nail salons indicate that PELs are rarely, if ever, exceeded. Many salon chemicals may cause health effects at concentrations below OSHA limits. Furthermore, OSHA does not have PELs for some of the chemicals (e.g.: ethyl methacrylate) common used in artificial nail products.

## Resources

### ***Government Agencies***

Massachusetts Department of Labor Standards  
Massachusetts Workplace Safety and Health Program  
1001 Watertown Street Newton, MA 02465  
617-969-7177  
[www.mass.gov/dols](http://www.mass.gov/dols)

Occupational Safety and Health Administration (OSHA)  
[www.osha.gov](http://www.osha.gov)

#### **Area Offices of OSHA**

639 Granite Street, 4th floor  
Braintree, MA 02184  
617-565-6924

1441 Main Street, Room 1550  
Springfield, MA 01103  
413-785-0123

Shattuck Office Center  
138 River Road, Suite 102  
Andover, MA 01810  
978-837-4460

Massachusetts Board of Cosmetology  
239 Causeway Street, Suite 500  
Boston, MA 02114  
617-727-4095  
[www.state.ma.us/reg/boards/hd/default.htm](http://www.state.ma.us/reg/boards/hd/default.htm)

Toxics Use Reduction Institute  
University of Massachusetts Lowell  
One University Avenue  
Lowell, MA 01854 9  
78-934-3275  
[www.turi.org](http://www.turi.org)

### ***Worker Health and Safety Resources-Coalitions for Occupational Safety and Health***

MassCOSH  
42 Charles Street  
Boston, MA 02122  
617-825-7233

Western MassCOSH  
640 Page Blvd.  
Springfield, MA 01104  
413-731-0760

#### ***HVAC Resources***

American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)  
1791 Tullie Circle, N.E.  
Atlanta, GA 30329  
[www.ashrae.org](http://www.ashrae.org)

International Code Council  
5203 Leesburg Pike, Suite 600  
Falls Church, VA 22041  
[www.iccsafe.org](http://www.iccsafe.org)